

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-219664
(43)Date of publication of application : 10.08.1999

(51)Int.CI. H01J 29/02

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(22)Date of filing : 09.11.1998 (72)Inventor : HASEGAWA KOSHI

(30)Priority

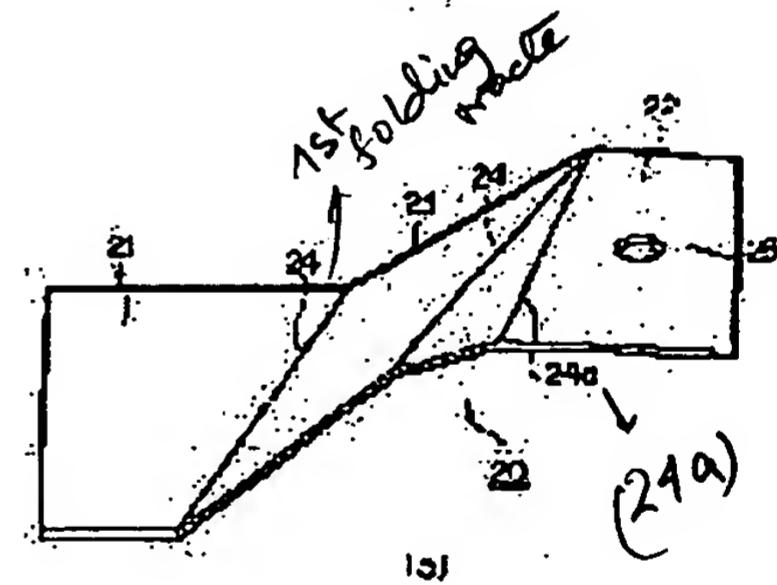
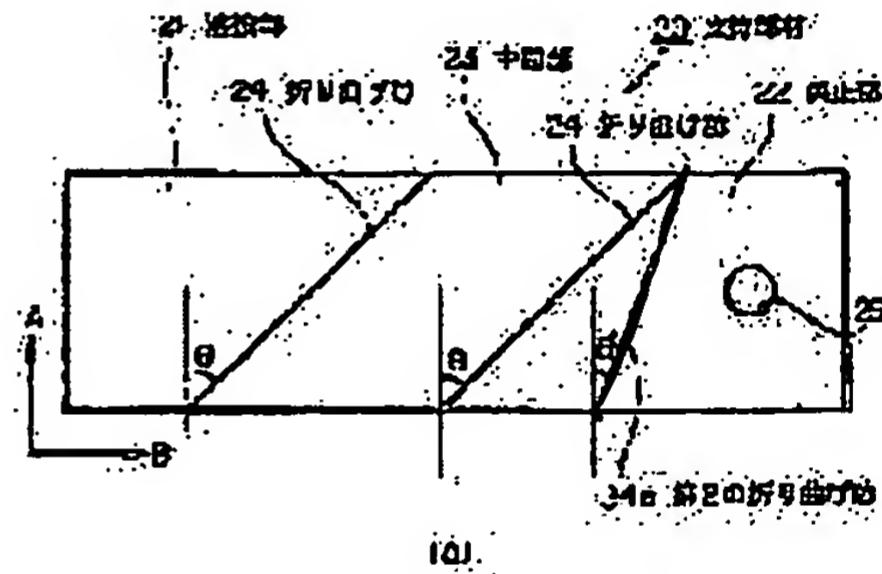
Priority number : 09325616 Priority date : 27.11.1997 Priority country : JP

(54) CATHODE-RAY TUBE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a cathode-ray tube which can prevent mislanding caused by thermal expansion, etc., without use of any expensive bimetal component and can reduce damage of a fixing pin in association with mounting and removal of a color selecting mechanism.

SOLUTION: In this cathod-ray tube, a plate-shaped supporting member 20 for mounting a color selecting mechanism on the inside of a phosphor panel is composed of a welding part 21 to be welded to the side with color selecting mechanism, a locking part 22 to be locked to the side with phosphor panel, and an intermediate part 23 which couples the two parts 21 and 22, and a pair of folding traces 24 to partition the welding part 21, locking part 22, intermediate part 23 are provided while forming a prescribed angle θ with the direction A across the width of the member, and within the locking part 22 a second folding trace 24a is provided for correcting the inclination of the plane of the locking part 22 with respect to the plane of the welding part 21.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision
of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

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(19)日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開平11-219664

(43)公開日 平成11年(1999)8月10日

(51)Int.Cl.⁸

H01J 29/02

識別記号

F I

H01J 29/02

B

審査請求 未請求 請求項の数1 OL (全7頁)

(21)出願番号 特願平10-317038

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(22)出願日 平成10年(1998)11月9日

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(32)優先日 平9(1997)11月27日

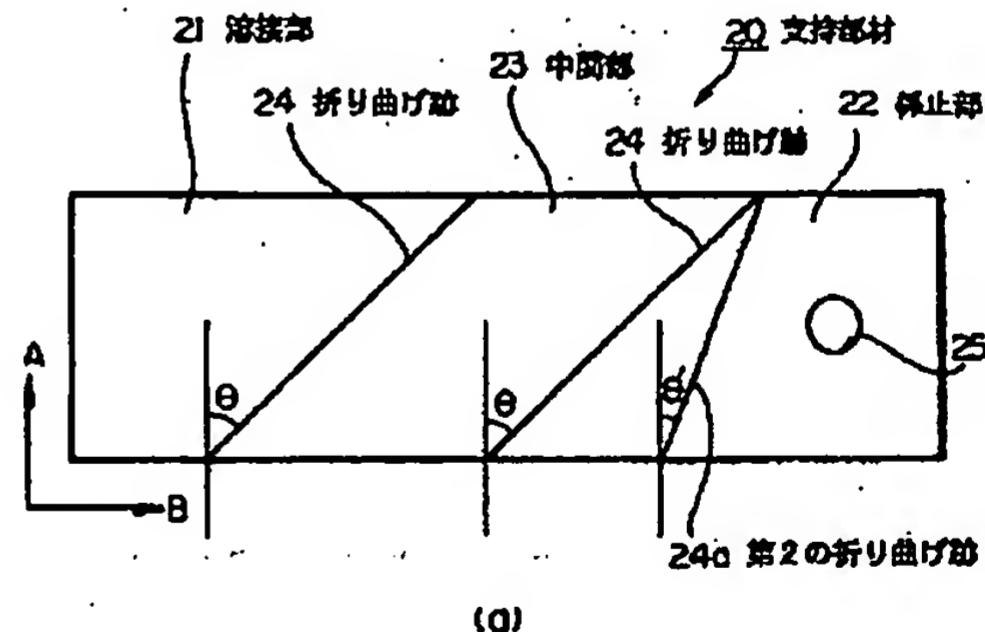
(33)優先権主張国 日本 (JP)

(54)【発明の名称】 陰極線管

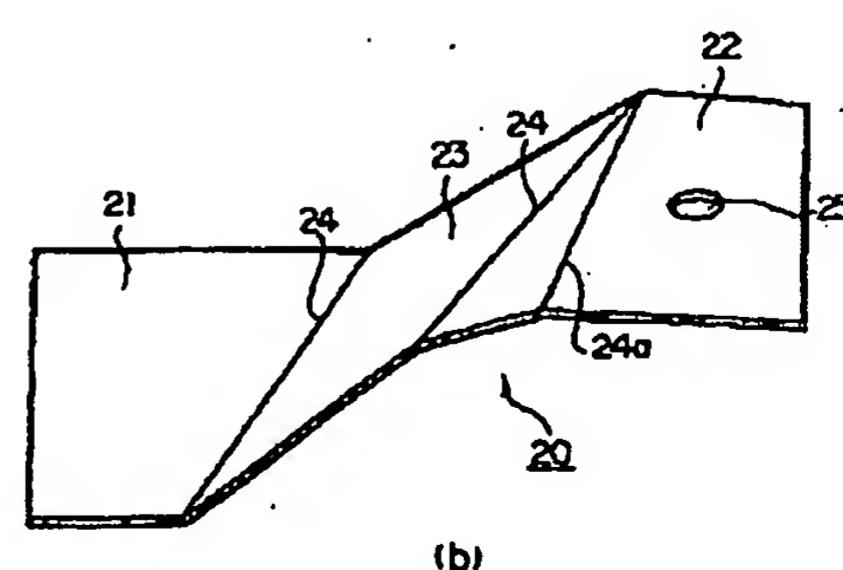
(57)【要約】

【課題】 高価なバイメタル部品を使用しなくとも熱膨張等によるミスランディングを防止できるとともに、色選別機構の着脱に伴う固定ピンの傷つきを低減できる陰極線管を提供する。

【解決手段】 荧光体パネルの内面側に色選別機構を装着するための板状の支持部材20を、色選別機構側に溶接される溶接部21と、蛍光体パネル側に係止される係止部22と、これらを連結する中間部23とから構成するとともに、溶接部21、係止部22及び中間部23を区画する一対の折り曲げ跡24を、その部材幅方向Aと所定の角度θをなして形成し、かつ係止部22内に、溶接部21平面に対する係止部22平面の傾きを補正するための第2の折り曲げ跡24aを形成した。



(a)



(b)

【特許請求の範囲】

【請求項1】 蛍光体パネルの内面側に板状の支持部材を介して色選別機構を装着してなる陰極線管において、前記支持部材は、前記色選別機構側に溶接される溶接部と、前記蛍光体パネル側に係止される係止部と、前記溶接部と前記係止部とを連結する中間部とから成るとともに、

前記溶接部、前記係止部及び前記中間部を区画する一対の折り曲げ跡が、その部材幅方向と所定の角度をなして形成され、

かつ、前記係止部内及び前記中間部内の少なくともいずれか一方に、前記溶接部平面に対する前記係止部平面の傾きを補正するための第2の折り曲げ跡を形成してなることを特徴とする陰極線管。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、カラー受像機等に搭載される陰極線管に係わり、特に、蛍光体パネルに色選別機構を装着するための支持構造に関する。

【0002】

【従来の技術】図9は従来における陰極線管の構成例を示す斜視図であり、図10はその陰極線管に組み込まれた色選別機構を示す斜視図である。図示のように陰極線管1は、R(赤)、G(緑)、B(青)の色蛍光体からなる蛍光面が内面側に形成された蛍光体パネル2と、この蛍光体パネル2の内面側に装着された色選別機構3と、蛍光体パネル2にフリットシール部4を介して接合されたファンネル5と、このファンネル5のネック部分に封止された電子鏡6とから構成されている。

【0003】このうち、色選別機構3は、電子鏡6から放射された各色の電子ビームを選択的に通過させるもので、これは、多數の小孔またはスリット孔をパターン形成してなる色選別マスク7と、この色選別マスク7を支持するフレーム8とから構成されている。また、色選別機構3のフレーム8には、ホルダ9を介して板状の支持部材10が取り付けられている。

【0004】支持部材10は、蛍光体パネル2に色選別機構3を装着するためのもので、その一端側に係止孔11が設けられている。一方、蛍光体パネル2の内周面には固定ピン12が設けられており、この固定ピン12に支持部材10の係止孔11を嵌め込むことで、蛍光体パネル2の内面側に色選別機構3が装着されている。

【0005】ところで、この種の陰極線管1においては、その動作時に電子ビームの衝突によって色選別マスク7が発熱し、これに伴う色選別機構3の熱膨張によってミスランディングが発生する。すなわち図11に示すように、例えばアバーチャグリル方式の場合、蛍光体パネル2の内面に形成された蛍光体ストライプ13と直交するフレーム長手方向に色選別機構3が熱膨張すると、これに追従して色選別マスク7も変位する。

【0006】そうすると、熱膨張していないときにG1の位置にあった任意のスリット孔が熱膨張によってG2の位置に変位し、これに伴ってG1位置のスリット孔を通過して蛍光面上の所定の位置P1に衝突していた電子ビームEbが、熱膨張後はG2の位置に変位した同じスリット孔を通過して蛍光面上のP2の位置に衝突し、これによって α 距離分のミスランディングが発生する。こうしたミスランディングは、輝度の低下や色ずれなどの不具合を招くため、何らかの対策が必要となる。

【0007】そこで従来においては、陰極線管1の動作時に電子ビームの衝突によって色選別機構3が熱膨張した際、それと同時に色選別機構3自体を蛍光体パネル2の内面側、つまり蛍光面側に移動させることでミスランディングを防ぐ措置が採られている。

【0008】具体的には図11において、熱膨張前は図中実線で示す位置にあった色選別マスク7を、熱膨張後には図中破線で示す位置まで進出させることで、フレーム長手方向における熱膨張後のスリット孔の位置G2を、図中破線矢印で示すように熱膨張前の電子ビームEbの軌道上に位置させ、これによって熱変形(膨張、収縮)に起因したミスランディングを防止する措置が採られている。

【0009】

【発明が解決しようとする課題】しかしながら従来では、フレーム8に取り付けられる支持部材10の構成として、熱膨張率の異なる2種類の金属板を溶接にて貼り合わせたバイメタルのバネ構造支持物(以下、バイメタル部品と称す)を採用しており、このバイメタル部品が非常に高価かつ加工性に難点があることから、陰極線管のコストダウンを図るうえで大きな障壁になっていた。

【0010】そこで本出願人は、高価なバイメタル部品を用いることなく、バイメタル部品と同様にミスランディングを防止することができる新規な支持部材を備えた陰極線管を既に提案している(特願平08-039356号明細書)。

【0011】上記先願の明細書に記載された陰極線管では、蛍光体パネルの内面側に色選別機構を装着するための板状の支持部材が、色選別機構側に溶接される溶接部と、蛍光体パネル側に係止される係止部と、その溶接部と係止部とを連結する中間部とから成り、しかもこれらの溶接部、係止部及び中間部を区画する一対の折り曲げ跡が、その部材幅方向と所定の角度をなして形成された構成となっている。そして、色選別機構が熱膨張を起こした際には、これを支持する支持部材が一対の折り曲げ跡の形成方向に従って変形することにより、色選別機構をパネル内面(蛍光面)側に移動させてミスランディングを防止するようにしている。

【0012】ところで、先願の支持部材を利用した陰極線管においては、溶接部を色選別機構側に溶接した状態

で、その反対側の係止部に設けられた係止孔を蛍光体パネルの固定ピンに嵌め込む際、固定ピンのリファレンス面（固定ピンが設けられるパネルスカート部の内周面と平行な仮想平面）に対して係止部平面が平行にならない。これは、色選別機構を支持するうえで支持部材の剛性を高くする必要があり、また色選別機構と蛍光体パネルとの間では支持部材に適度なバネ弾性を持たせる必要があることから、そのねじり剛性とバネ弾性により溶接部平面に対して係止部平面が傾いてしまうためである。ちなみに、係止部の係止孔を固定ピンに嵌める前と嵌めた後の状態をシミュレーション（FEM解析）で求めたところ、溶接部平面と係止部平面との関係はほとんど変わらないという結果が得られている。

【0013】このように係止部平面が傾いて嵌め込まれる状況では、蛍光体パネルの内面に赤、緑、青の蛍光体パターンを作製する工程で色選別機構の着脱を繰り返したときに、係止部の嵌脱によって固定ピンが傷つきやすくなり、この傷つきによる固定ピンの削りカスが電子銃に付着して陰極線管が放電しやすくなる。

【0014】そこで本発明では、高価なバイメタル部品を使用しなくとも熱膨張等によるミスランディングを防止できるとともに、色選別機構の着脱に伴う固定ピンの傷つきを低減できる陰極線管を提供することを目的とする。

【0015】

【課題を解決するための手段】本発明に係る陰極線管においては、蛍光体パネルの内面側に色選別機構を装着するための板状の支持部材が、色選別機構側に溶接される溶接部と、蛍光体パネル側に係止される係止部と、前記溶接部と前記係止部とを連結する中間部とから成るとともに、これら溶接部、係止部及び中間部を区画する一对の折り曲げ跡が、その部材幅方向と所定の角度をなして形成され、かつ、係止部内及び中間部内の少なくともいずれか一方、溶接部平面に対する係止部平面の傾きを補正するための第2の折り曲げ跡を形成した構成となっている。

【0016】上記構成からなる陰極線管においては、支持部材の溶接部を色選別機構側に溶接し、同係止部を蛍光体パネル側に係止した状態で、その動作時に色選別機構が熱膨張を起こすと、一对の折り曲げ跡の形成方向に従って溶接部とともに色選別機構がパネル内面（蛍光面）側に移動し、これによって色選別機構の熱膨張によるミスランディングが防止される。また、中間部内及び係止部内の少なくともいずれか一方に第2の折り曲げ跡を形成したことにより、溶接部平面に対する係止部平面の傾きを補正可能となる。

【0017】

【発明の実施の形態】以下、本発明の実施の形態について図面を参照しつつ詳細に説明する。図1は本発明に係る陰極線管の一実施形態として、色選別機構を蛍光体パ

ネルに装着するための支持部材の構成を説明する図であり、図中(a)はその展開図、(b)はその斜視図である。また、図上に付記したA、B方向のうち、A方向は支持部材の幅方向、B方向は支持部材の長手方向をそれぞれ示している。

【0018】図示した支持部材20は、薄い板状をなすものであって、色選別機構側（図9のフレーム8）に溶接される溶接部21と、蛍光体パネル側（図10の固定ピン12）に係止される係止部22と、これら溶接部21と係止部22とを連結する中間部23とから構成されている。また、溶接部21、係止部22及び中間部23は、一对の折り曲げ跡24、24によってそれぞれ区画され、各々の折り曲げ跡24、24を境に所定の角度で曲げ成形され、これによって溶接部21と係止部22との間に段差が確保されるようになっている。この段差は、係止部22に設けられた係止孔25（図例では丸孔）を、蛍光体パネル側の固定ピンに嵌め込む際に必要となるもので、折り曲げ跡24での初期の曲げ角度に応じて適宜設定される。

【0019】また、上述のように溶接部21、係止部22及び中間部23を区画する一对の折り曲げ跡24、24は、部材幅方向Aと所定の角度θ（図例では45°程度）をなして互いに平行に形成されている。折り曲げ跡24、24と部材幅方向Aとのなす角度θは、予め理論的または実験的に把握した色選別機構3の熱膨張によるミスランディング量（図1-1中のα量）を照準に、支持部材20の熱膨張率や、折り曲げ跡24での初期の曲げ角（中間部23の傾斜角）さらには部材長手方向Bにおける中間部23の長さL等を考慮して適宜設定される角度である。

【0020】さらに、係止孔25を有する係止部22内には、上記一对の折り曲げ跡24、24とは別の第2の折り曲げ跡24aが形成されている。この第2の折り曲げ跡24aは、係止部22と中間部23とを区画する折り曲げ跡24よりも部材幅方向Aとのなす角度θ'が小さく設定されている（θ>θ'）。そして、図1(b)に示すように支持部材20を曲げ成形した状態では、溶接部21と中間部23を区画する折り曲げ跡24での曲げ方向に対して、係止部22と中間部23を区画する折り曲げ跡24での曲げ方向が反対方向に設定され、係止部22内の第2の折り曲げ跡24aでの曲げ方向も反対方向に設定されている。

【0021】ここで、支持部材20に設けられた一对の折り曲げ跡24、24によるミスランディングの防止効果につき、図2及び図3を用いて説明する。

【0022】図2は支持部材20の変形作用を説明する平面図であり、図中(a)は変形前の状態を示し、(b)は変形後の状態を示している。先ず、図2(a)の状態は、溶接部21、係止部22及び中間部23が同一平面をなしている状態、つまり折り曲げ跡24、24

の部分が全く曲げられておらず、上述の段差が最小（ゼロ）の状態である。この変形前の状態では、係止部22の係止孔25の中心位置に対し、部材幅方向Aにおける溶接部21の変位量がゼロとなる。

【0023】一方、図2(b)の状態は、溶接部21側の折り曲げ跡24の部分が直角に折れ曲がり、さらに係止部22側の折り曲げ跡24の部分がそれと反対方向に直角に折れ曲がった状態で、上述の段差が最大の状態である。この変形後の状態では、係止部22の係止孔25の中心位置に対し、部材幅方向Aにおける溶接部21の変位量が $(L \times \sin \theta) / 2$ となる。

【0024】次に、こうした支持部材20の変形による色選別機構の動きについて図3を参照しつつ説明する。先ず、支持部材20の各区画領域のうち、溶接部21は色選別機構のフレームに直にまたはホルダ9を介して溶接される。通常、フレームへの取り付けに際してはスポット溶接が採用されるため、溶接部21にはスポット溶接による溶接痕26が残る。また係止部22は、そこに設けられた係止孔25(図例では三角孔)を蛍光体パネル側の固定ピンに嵌め込むことで係止されるため、この係止孔25の位置は熱変形等が生じても変位しない固定された位置となる。

【0025】このように色選別機構のフレームに支持部材20を取り付けて、蛍光体パネルの内面側に支持部材20を介して色選別機構を装着した状態では、色選別機構の熱膨張に伴う支持部材20の変形により、色選別機構自体が以下のような挙動を示す。

【0026】すなわち、色選別機構3が熱膨張する前の段階では、折り曲げ跡24, 24での初期の曲げ角に応じて、係止部22の係止孔25の中心位置に対し、溶接部21の溶接痕26の位置が部材幅方向(補正方向Zと同一方向)にM寸法分だけずれた状態となる。この状態から色選別機構3が熱膨張すると、支持部材20に対しては、上述のように係止部22の係止孔25を固定位置として、その反対側の溶接部21に、色選別機構3の熱膨張方向に対応した押圧力が加わる。

【0027】そうすると、支持部材20は一对の折り曲げ跡24, 24の形成方向に応じて図中実線で示す位置から図中二点鎖線で示す位置へと変位するため、部材幅方向(Z)では上記ずれ寸法Mが小さくなる。これにより、係止孔25の中心位置に対して、溶接痕26の位置がN寸法分だけ近づくため、それと同じN寸法分だけ色選別機構3が蛍光体パネル2の蛍光面側に近づくようになる。

【0028】したがって、色選別機構3の熱膨張前後でも、アパーチャグリル7の任視のスリット孔を通過する電子ビームが蛍光面上の規定の位置に衝突するよう、各折り曲げ跡24, 24の形成方向を含むバラメータをもって、熱膨張後におけるアパーチャグリル7の移動位置(N寸法分の移動量)を上記図11に示す条件で規定す

ることにより、色選別機構の熱膨張に起因したミスランディングを防止することが可能となる。

【0029】ちなみに、支持部材20に設けられた一对の折り曲げ跡24, 24については必ずしも平行に形成されている必要はなく、例えば図1において溶接部21側の折り曲げ跡24の形成角度θに対して係止部22側の折り曲げ跡24をそれよりも小さな角度θで形成した場合でも、ミスランディングの防止効果を得ることは可能である。

【0030】続いて、支持部材20の構造と取付状態の関係を図4及び図5を用いて説明する。図4は支持部材20の構造を3つのタイプに分けたもので、図中(a)は溶接部21、係止部22及び中間部23を区画する一对の折り曲げ跡24, 24が部材幅方向Aと平行に形成されたもの、(b)は一对の折り曲げ跡24, 24が部材幅方向Aと所定の角度をなすように形成されたもの、(c)は一对の折り曲げ跡24, 24が部材幅方向Aと所定の角度をなすように形成されかつ係止部22内に第2の折り曲げ跡24aが設けられたものである。このうち、(b)のタイプは先述の特願平08-039356号明細書に開示されたもので、(c)のタイプは本実施形態で採用したものである。

【0031】こうした3つのタイプの支持部材20に関して、個々の溶接部21を色選別機構のフレームに溶接した状態で、係止部22の係止孔25をパネル側の固定ピンに嵌め込む際には、図5((a)～(c))に示すように、いずれのタイプでも溶接部平面21aが固定ピン12のリファレンス面Fと平行になるのに対し、係止部平面22aはタイプごとに異なったものとなる。

【0032】即ち、図4(a)のタイプの支持部材20では、一对の折り曲げ跡24, 24が部材幅方向Aと平行になっていることから、図5(a)に示すように、固定ピン12のリファレンス面Fに対して係止部平面22aが平行に嵌め込まれる。しかし、このタイプの場合には、支持部材20の変形によって色選別機構をパネル内面側に移動させることができないため、ミスランディングの防止効果を得ることはできない。

【0033】一方、図4(b)のタイプの支持部材20では、一对の折り曲げ跡24, 24が部材幅方向と所定の角度をなしていることから、前述のようにミスランディングの防止効果は得られるものの、その取り付けにあたっては、図5(b)に示すように固定ピン12のリファレンス面Fに対し、係止部平面22aが傾いた状態で嵌め込まれてしまう。

【0034】これに対して、図4(c)のタイプの支持部材20では、一对の折り曲げ跡24, 24が部材幅方向と所定の角度をなし、かつ係止部22内に第2の折り曲げ跡24aが設けられていることから、図4(b)のタイプと同様にミスランディングの防止効果が得られ、しかもその取り付けにあたっては、第2の折り曲げ跡2

4 aでの曲げ成形によって溶接部平面21 aに対する係止部平面22 aの傾きを補正できるため、図5(c)に示すように固定ピン12のリファレンス面Fに対し、係止部平面22 a(係止孔25の周辺領域)がより平行に近い状態で嵌め込まれるようになる。これにより、蛍光体パターンの作製工程で色選別機構の着脱を繰り返した場合でも、係止部22の嵌脱によって固定ピン12が傷つくことが少なくなる。

【0035】なお、上記実施形態においては、蛍光体パネル側に係止される係止部22内に、該係止部22と中間部23とを区画する折り曲げ跡24の一端から分岐させたかたちで第2の折り曲げ跡24 aを形成するとともに、この第2の折り曲げ跡24 aと部材幅方向Aとのなす角度θ'を一对の折り曲げ跡24, 24のそれよりも小さくなるように設定したが、本発明はこれに限定されるものではない。

【0036】すなわち、図6(a)に示すように、係止部22と中間部23とを区画する折り曲げ跡24の一端から位置をずらして第2の折り曲げ跡24 aを形成したものや、図6(b)に示すように、係止部22と中間部23とを区画する折り曲げ跡24の他端から分岐させたかたちで第2の折り曲げ跡24 aを形成したものであっても、上記同様の作用効果を得ることができる。ちなみに、図6(b)に示す支持部材20においては、第2の折り曲げ跡24 aと部材幅方向A(図1参照)とのなす角度が一对の折り曲げ跡24, 24のそれよりも大きく設定されている。

【0037】また、第2の折り曲げ跡24 aを形成する部位としても係止部22内に限らず、該係止部22に隣接する中間部23内に第2の折り曲げ跡24 aを形成したものであってもよい。具体的には、例えば、図7(a)に示すように、係止部22と中間部23とを区画する折り曲げ跡24の一端から分岐させたかたちで中間部23内に第2の折り曲げ跡24 aを形成したものや、図7(b)に示すように、中間部23の部材幅方向の一辺から他辺にわたって第2の折り曲げ跡24 aを形成したもの、或いは図7(c)に示すように、第2の折り曲げ跡24 aの形成角度(傾斜)を異ならせたものなど、種々の形態を採用することができる。

【0038】さらに、これらの組み合わせとして図8(a)に示すように、係止部22内と中間部23内の双方にそれぞれ第2の折り曲げ跡24 aを形成したものであってもよく、図8(b)に示すように、係止部22内(又は中間部23内)に2つ(又は2つ以上)の折り曲

げ跡24 aを形成したものであってもよい。また、第2の折り曲げ跡24 aを曲げ成形する際の曲げ方向としても、特にいずれか一方向に限定されるものでなく、一对の折り曲げ跡24, 24での各曲げ角度等との関係で適宜設定することにより、上記同様に係止部22平面の傾きを補正することが可能となる。

【0039】

【発明の効果】以上説明したように本発明の陰極線管によれば、蛍光体パネルに色選別機構を装着するための支持部材の構成として、溶接部、係止部及び中間部を区画する一对の折り曲げ跡を部材幅方向と所定の角度をなして形成し、かつ中間部内及び係止部内の少なくともいずれか一方に第2の折り曲げ跡を形成することで、色選別機構の熱膨張に伴うミスランディングを防止できるとともに、蛍光体パネル側の固定ピンのリファレンス面に係止部平面をより平行に近い状態で嵌め込むことができるため、固定ピンの削れとその削りカスに起因した放電現象を有効に防止することが可能となる。

【図面の簡単な説明】

【図1】本発明に係る陰極線管の一実施形態として、色選別機構を蛍光体パネルに装着するための支持部材の構成を説明する図である。

【図2】支持部材の変形作用を説明する平面図である。

【図3】支持部材の変形による色選別機構の動きを説明する図である。

【図4】支持部材の構造をタイプ別に示した図である。

【図5】支持部材のタイプ別の取付状態を示す図である。

【図6】本発明の変形例を説明する図(その1)である。

【図7】本発明の変形例を説明する図(その2)である。

【図8】本発明の変形例を説明する図(その3)である。

【図9】従来における陰極線管の構成例を示す斜視図である。

【図10】色選別機構の構成例を示す斜視図である。

【図11】ミスランディングを説明する模式図である。

【符号の説明】

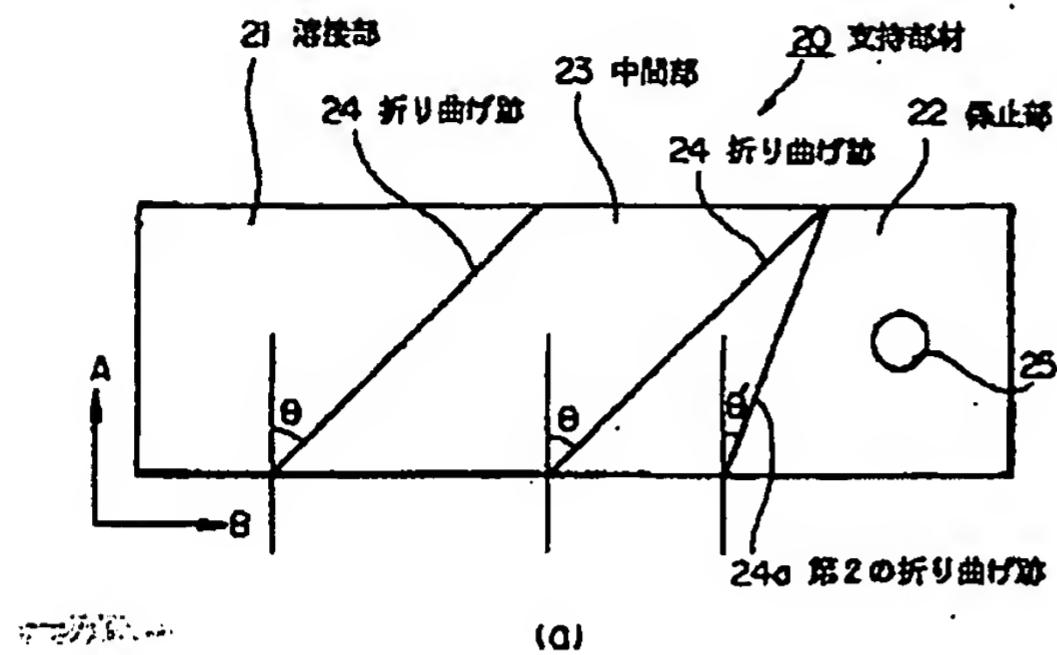
1…陰極線管、2…蛍光体パネル、3…色選別機構、1

2…固定ピン、20…支持部材、21…溶接部、22…

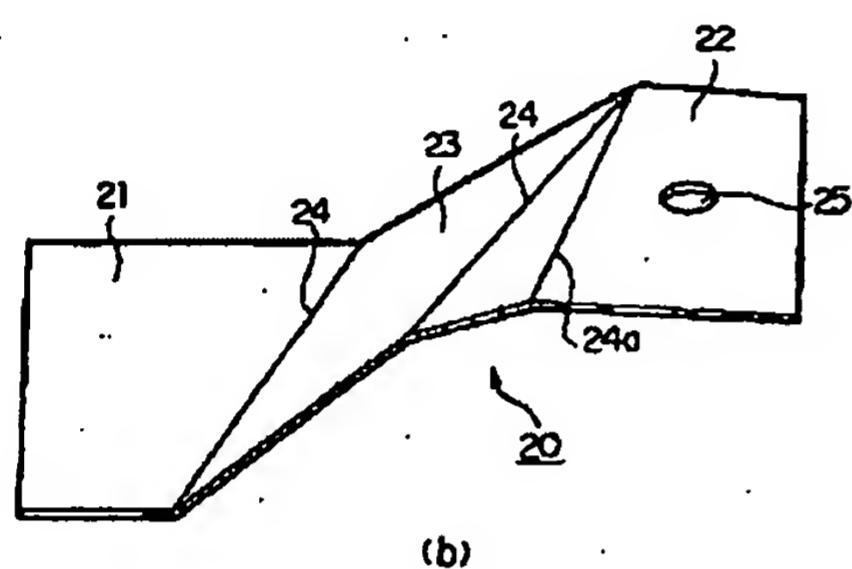
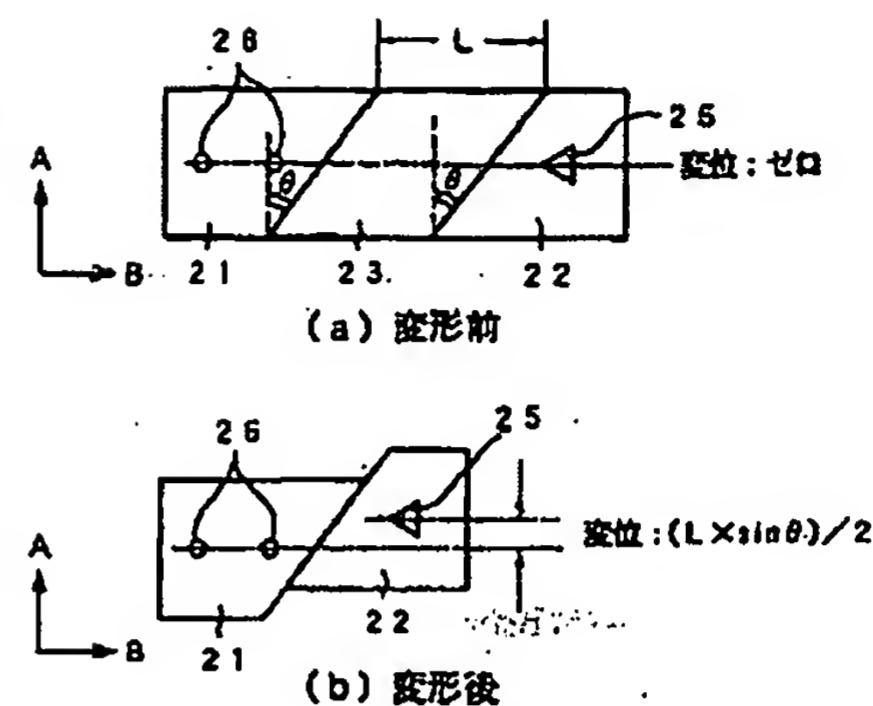
係止部、23…中間部、24…折り曲げ跡、24 a…第

2の折り曲げ跡、25…係止孔、F…リファレンス面

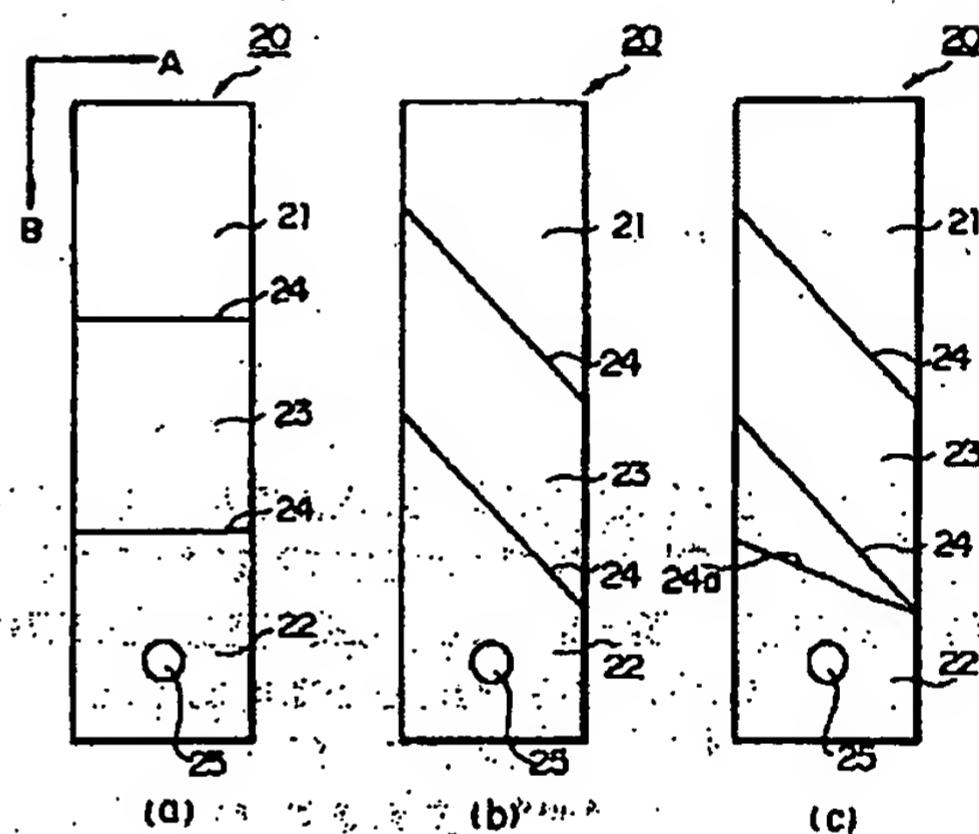
【図1】



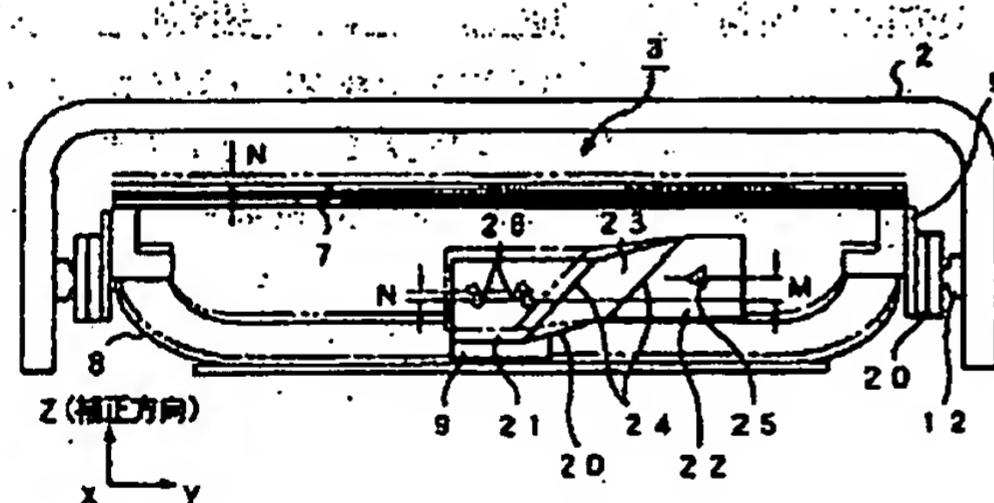
【図2】



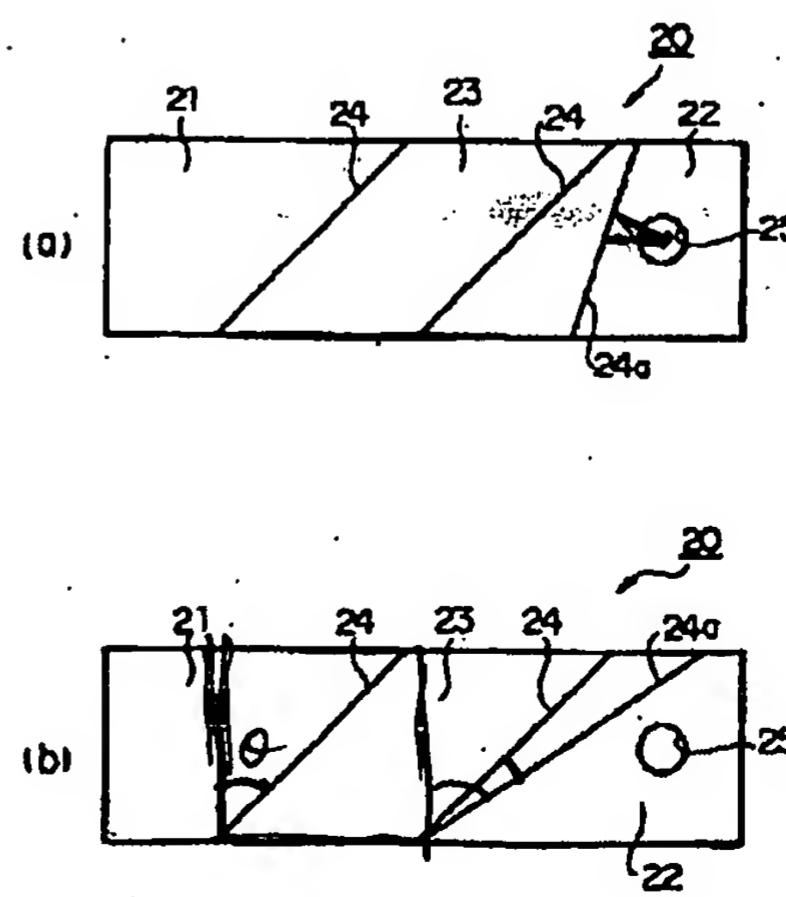
【図4】



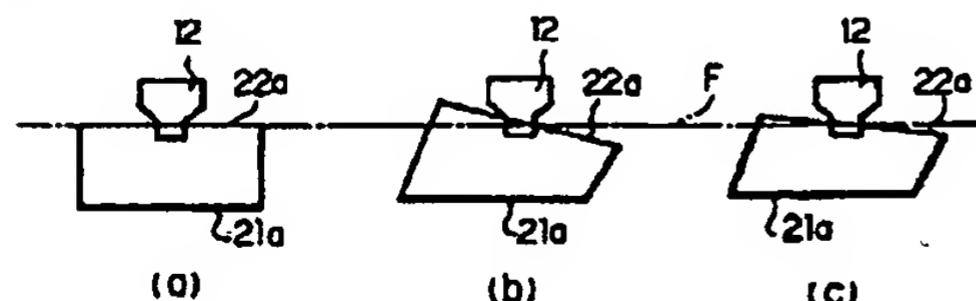
【図3】



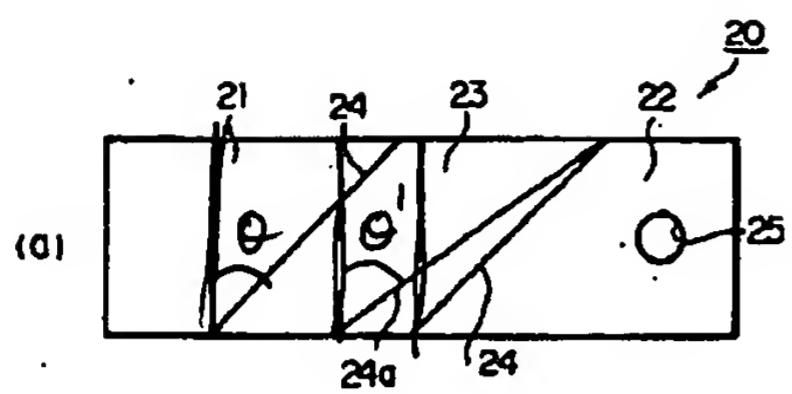
【図6】



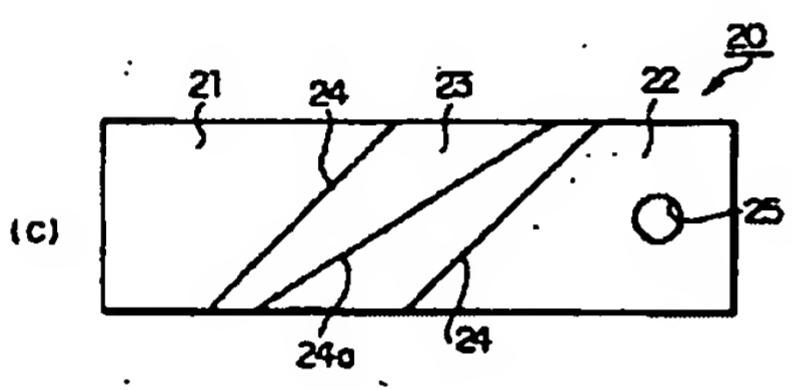
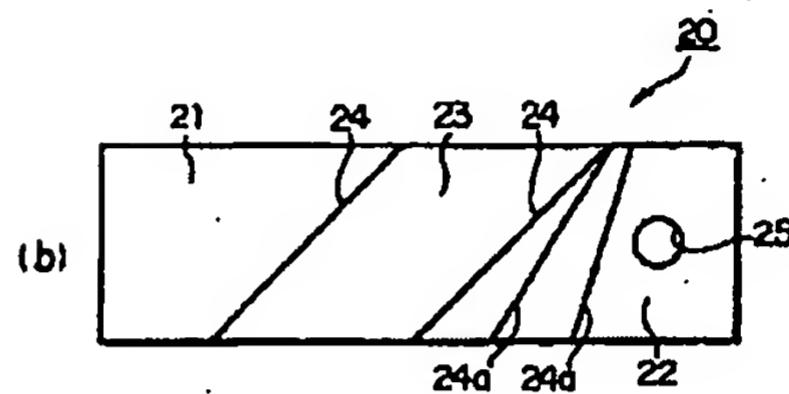
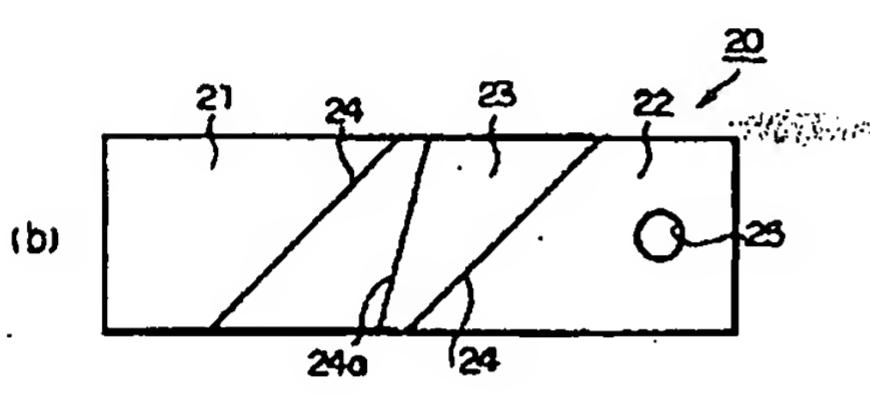
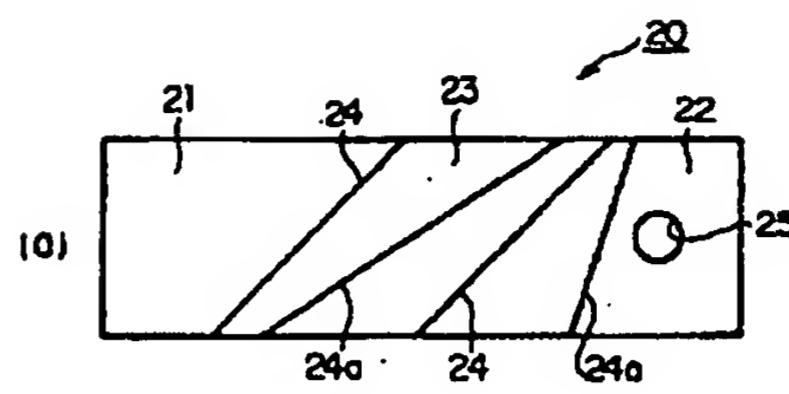
【図5】



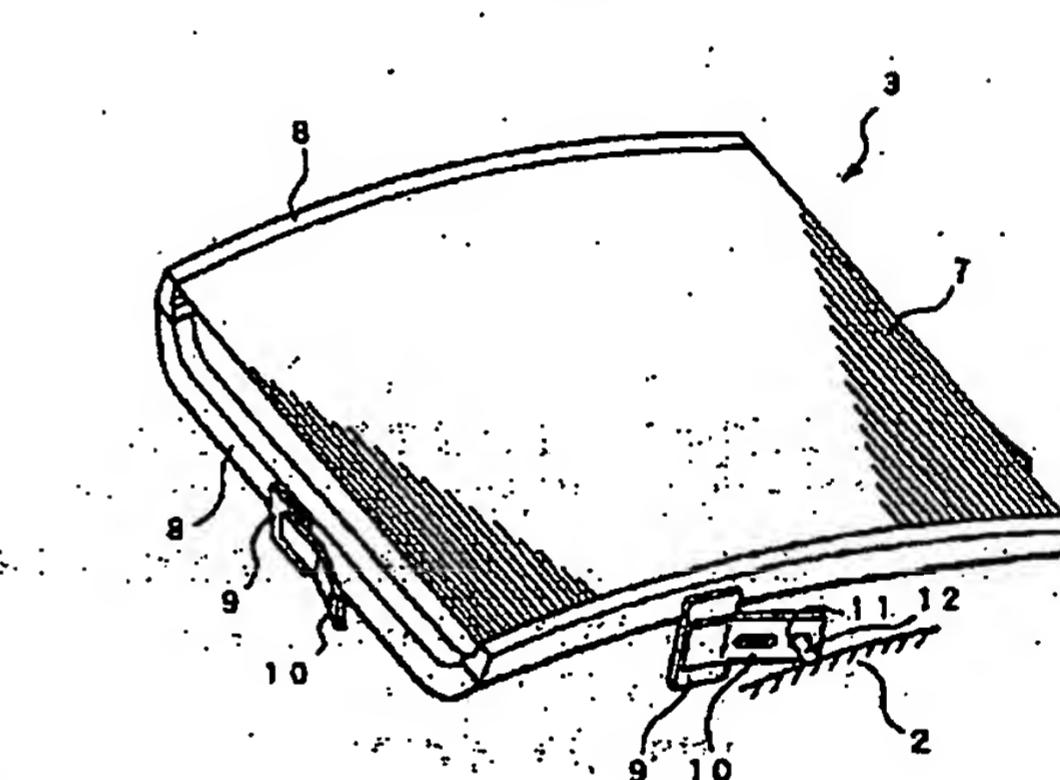
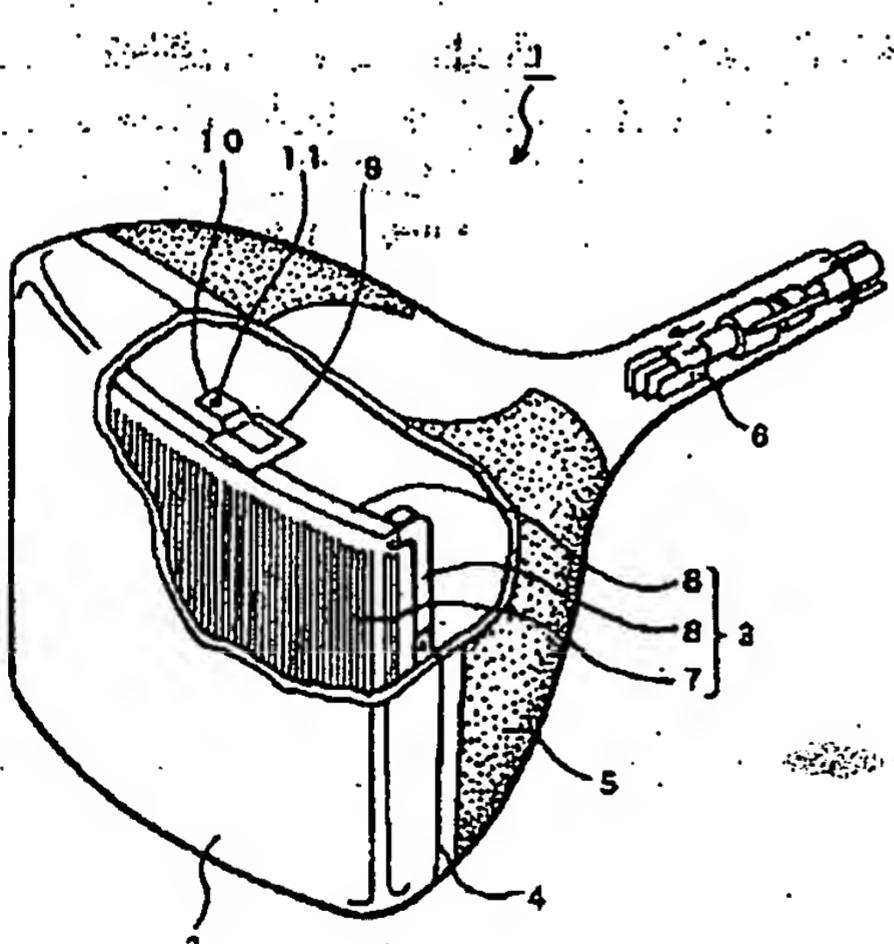
【図7】



【図8】

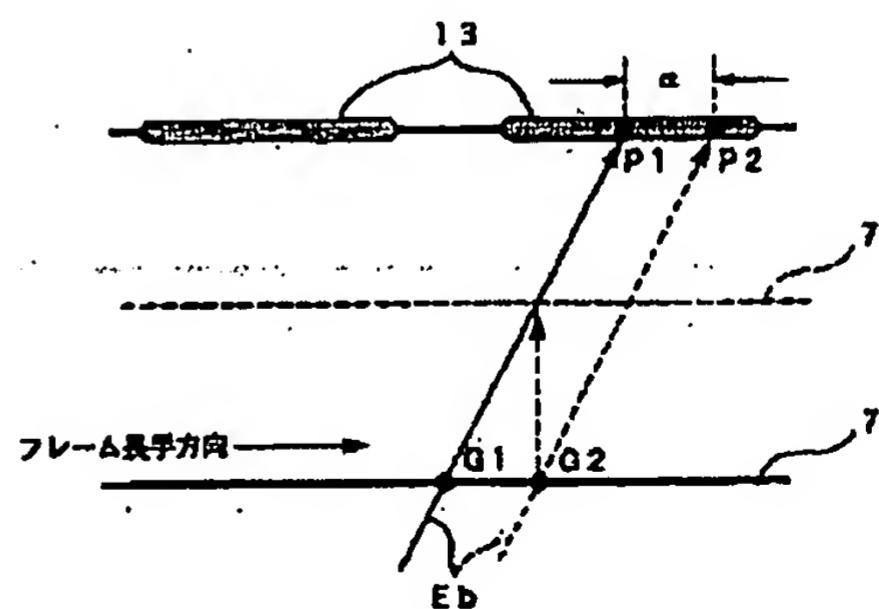


【図9】



【図10】

【図11】



CLAIMS

[Claim(s)]

[Claim 1] In the cathode-ray tube which comes to equip the inner surface side of a fluorescent substance panel a color sorting machine style through tabular supporter material said supporter material While consisting of the pars intermedia which connects the weld zone welded to said color sorting machine style side, the stop section stopped at said fluorescent substance panel side, and said weld zone and said stop section The remains of bending of the couple which divides said weld zone, said stop section, and said pars intermedia The cathode-ray tube which makes the member cross direction and a predetermined include angle, and is formed, and is characterized by coming to form the 2nd remains of bending for amending the inclination of said stop section flat surface [as opposed to / at least / said weld zone flat surface to either] said stop circles and in said pars intermedia.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the supporting structure for equipping a fluorescent substance panel with a color sorting machine style especially with respect to the cathode-ray tube carried in a color receiving set etc.

[0002]

[Description of the Prior Art] Drawing 9 is the perspective view showing the example of a configuration of the cathode-ray tube in the former, and drawing 10 is the perspective view showing the color sorting machine style included in the cathode-ray tube. The cathode-ray tube 1 consists of a color sorting machine style 3 by which the inner surface side of the fluorescent substance panel 2 formed in the inner surface side and this fluorescent substance panel 2 was equipped with the phosphor screen which consists of a color fluorescent substance of R (red), G (green), and B (blue), a funnel 5 with which it was joined to the fluorescent substance panel 2 through the frit seal section 4, and an electron gun 6 closed by the neck part of this funnel 5 like a graphic display.

[0003] Among these, the color sorting machine style 3 passes selectively the electron beam of each color emitted from the electron gun 6, and this consists of a color sorting mask 7 which comes to carry out pattern formation of many stomata or slit holes, and a frame 8 which supports this color sorting mask 7. Moreover, the tabular supporter material 10 is attached in the frame 8 of the color sorting machine style 3 through the holder 9.

[0004] The supporter material 10 is for equipping the fluorescent substance panel 2 with the color sorting machine style 3, and the stop hole 11 is formed in the end side. On the other hand, the lock-pin 12 is formed in the inner skin of the fluorescent substance panel 2, and the inner surface side of the fluorescent substance panel 2 is equipped with the color sorting machine style 3 by inserting the stop hole 11 of the supporter material 10 in this lock-pin 12.

[0005] By the way, in this kind of cathode-ray tube 1, the color sorting mask 7 generates heat by the collision of an electron beam at the time of that actuation, and mistake landing occurs by the thermal expansion of the color sorting machine style 3 accompanying this. That is, if the color sorting machine style 3 expands thermally to the frame longitudinal direction which intersects perpendicularly with the fluorescent substance stripe 13 formed in the inner surface of the fluorescent substance panel 2 in the case of an aperture grille method as shown in drawing 11 for example, this will be followed and the color sorting mask 7 will also be displaced.

[0006] If it does so, the slit hole of the arbitration which was in the location of G1 while not expanding thermally will displace in the location of G2 by thermal expansion. The same slit hole with which the electron beam Eb which passed the slit hole of G1 location in connection with this, and conflicted with the position P1 on a phosphor screen displaced after thermal expansion in the location of G2 is passed, it collides with the location of P2 on a phosphor screen, and the mistake landing for alpha distance occurs by this. In order that such mistake landing may cause nonconformities, such as lowering of brightness, and a color gap, a certain cure is needed.

[0007] Then, in the former, when the color sorting machine style 3 expands thermally by the collision of an electron beam at the time of actuation of a cathode-ray tube 1, the measure which prevents mistake landing by making it and coincidence move color sorting machine style 3 the very thing to the inner surface, i.e., phosphor screen, side of the fluorescent substance panel 2 is taken.

[0008] It is making it specifically march out to the location which shows the color sorting mask 7 which was in the location which shows by the drawing solid line before thermal expansion in drawing 11 by the drawing destructive line after thermal expansion. The location G2 of the slit hole after the thermal expansion in a frame longitudinal direction is located on the orbit of thermal expansion Saki's electron beam Eb, as a drawing destructive line arrow head shows, and the measure of preventing the mistake landing which originated in heat deformation (expansion, contraction) by this is taken.

[0009]

[Problem(s) to be Solved by the Invention] However, in the former, the spring structure support (bimetal components are called hereafter) of the bimetal which stuck two kinds of metal plates with which coefficient of thermal expansion differs by welding as a configuration of the supporter material 10 attached in a frame 8 was adopted, this bimetal component was dramatically expensive, and since the difficulty was in workability, when aiming at the cost cut of a cathode-ray tube, it had become a serious failure.

[0010] Then, these people have already proposed the cathode-ray tube equipped with the new supporter material which can prevent mistake landing like bimetal components, without using expensive bimetal components (Japanese-Patent-Application-No. No. 039356 [08 to] description).

[0011] In the cathode-ray tube indicated by the description of the above-mentioned point ** The weld zone by which the tabular supporter material for equipping the inner surface side of a fluorescent substance panel with a color sorting machine style is welded to a color sorting machine style side, It consists of the pars intermedia which connects the stop section stopped at a fluorescent substance panel side, and its weld zone and stop section, and the remains of bending of the couple which moreover divides those weld zones, the stop section, and pars intermedia have composition which made the member cross direction and a predetermined include angle, and was formed. And when the supporter material which supports this deforms according to the formation direction of the remains of bending of a couple, he moves a color sorting machine style to a panel inner surface (phosphor screen) side, and is trying to prevent mistake landing, when a color sorting machine style causes thermal expansion.

[0012] By the way, in the cathode-ray tube using the supporter material of point **, it is in the condition which welded the weld zone to the color sorting machine style side, and in case the stop hole prepared in the stop section of the opposite hand is inserted in the lock-pin of a fluorescent substance panel, a stop section flat surface is not parallel to the reference side (virtual flat surface parallel to the inner skin of the panel skirt section in which a lock-pin is prepared) of a lock-pin. Since this needs to make rigidity of supporter material high when supporting a color sorting machine style, and it needs to give moderate spring elasticity to supporter material between a color sorting machine style and a fluorescent substance panel, it is for a stop section flat surface to incline to a weld zone flat surface with the torsal rigidity and spring elasticity. When the condition after inserting in incidentally with Saki who inserts the stop hole of the stop section in a lock-pin is searched for in simulation (FEM analysis), the result that the relation between a weld zone flat surface and a stop section flat surface hardly changes is obtained.

[0013] Thus, in the situation that a stop section flat surface inclines and is inserted in, when attachment and detachment of a color sorting machine style are repeated at the process which produces red, green, and a blue fluorescent substance pattern to the inner surface of a fluorescent substance panel, a lock-pin becomes easy to get damaged by attachment and detachment of the stop section, the shaving dregs of this lock-pin twisted for getting damaged adhere to an electron gun, and a cathode-ray tube becomes easy to discharge.

[0014] So, in this invention, even if it does not use expensive bimetal components, while being able to prevent the mistake landing by thermal expansion etc., it aims at offering the cathode-ray tube which can decrease with [of the lock-pin accompanying attachment and detachment of a color sorting machine style] a blemish.

[0015]

[Means for Solving the Problem] The weld zone by which the tabular supporter material for equipping the inner surface side of a fluorescent substance panel with a color sorting machine style is welded to a color sorting machine style side in the cathode-ray tube concerning this invention, While consisting of the pars intermedia which connects the stop section stopped at a fluorescent substance panel side, and said weld zone and said stop section The remains of bending of the couple which divides these weld zones, the stop section, and pars intermedia make the member cross direction and a predetermined include angle, and are formed. And it has the composition in which the 2nd remains of bending for amending the inclination of the as opposed to [at least] weld zone flat surface to either stop section flat surface stop circles and in pars intermedia were formed.

[0016] It is in the condition which welded the weld zone of supporter material to the color sorting machine style side, and stopped this stop section to the fluorescent substance panel side in the cathode-ray tube which consists of the above-mentioned configuration. If a color sorting machine style causes thermal expansion at the time of the actuation, according to the formation direction of the remains of bending of a couple, a color sorting machine style will move to a panel inner surface (phosphor screen) side with a weld zone, and the mistake landing by the thermal expansion of a color sorting machine style will be prevented by this. Moreover, amendment of the inclination of the stop section flat surface over a weld zone flat surface is attained by [of inside of pars intermedia, and stop circles] having formed the 2nd remains of bending in either at least.

[0017]

[Embodiment of the Invention] Hereafter, it explains to a detail, referring to a drawing about the gestalt of operation of this invention. Drawing 1 is drawing which explains the configuration of the supporter material for equipping a fluorescent substance panel with a color sorting machine style as 1 operation

gestalt of the cathode-ray tube concerning this invention, among drawing, (a) is the development view and (b) is the perspective view. Moreover, in the cross direction of supporter material, and the direction of B, the direction of A shows the longitudinal direction of supporter material among A written in addition on drawing, and the direction of B, respectively.

[0018] The illustrated supporter material 20 makes tabular [thin], and consists of pars intermedia 23 which connects the weld zone 21 welded to a color sorting machine style side (frame 8 of drawing 9), the stop section 22 stopped at a fluorescent substance panel side (lock-pin 12 of drawing 10), and these weld zones 21 and the stop section 22. Moreover, a weld zone 21, the stop section 22, and pars intermedia 23 are divided by the remains 24 and 24 of bending of a couple, respectively, bending shaping is carried out at an angle of predetermined bordering on each remains 24 and 24 of bending, and a level difference is secured by this between a weld zone 21 and the stop section 22. In case this level difference inserts in the lock-pin by the side of a fluorescent substance panel the stop hole 25 (the example of drawing round hole) prepared in the stop section 22, it is needed, and it is suitably set up according to the angle of bend in early stages of the remains 24 of bending. /

[0019] Moreover, the remains 24 and 24 of bending of the couple which divides a weld zone 21, the stop section 22, and pars intermedia 23 as mentioned above make the member cross direction A and the predetermined include angle theta (the example of drawing about 45 degrees), and are mutually formed in parallel. The include angle theta which the remains 24 and 24 of bending and the member cross direction A make The amount of mistake landing by the thermal expansion of the color sorting machine style 3 grasped theoretically or experimentally beforehand (the amount of alpha in drawing 11) to collimation It is the include angle suitably set up in consideration of die-length [of the bending angle in early stages of the coefficient of thermal expansion and the remains 24 of bending of the supporter material 20 (tilt angle of pars intermedia 23), and the pars intermedia / in / further / the member longitudinal direction B / 23] L etc.

[0020] Furthermore, in the stop section 22 which has the stop hole 25, 2nd remains of bending 24a with the another remains 24 and 24 of bending of a up Norikazu pair is formed. Include-angle theta' with the member cross direction A to make is small set up rather than the remains 24 of bending where this 2nd remains of bending 24a divides the stop section 22 and pars intermedia 23 ($\theta > \theta'$). And as shown in drawing 1 (b), where bending shaping of the supporter material 20 is carried out, the direction of bending in the remains 24 of bending which divide the stop section 22 and pars intermedia 23 to the direction of bending in the remains 24 of bending which divide a weld zone 21 and pars intermedia 23 is set as an opposite direction, and the direction of bending in 2nd remains of bending 24a in the stop section 22 is also set as the opposite direction.

[0021] Here, it explains using drawing 2 and drawing 3 about the remains 24 of bending of a couple established in the supporter material 20, and the prevention effectiveness of the mistake landing depended 24.

[0022] Drawing 2 is a top view explaining the deformation process of the supporter material 20, among drawing, (a) shows the condition before deformation and (b) shows the condition after deformation. First, the part in the condition 24 and 24 of bending that, as for the condition of drawing 2 (a), a weld zone 21, the stop section 22, and pars intermedia 23 are making the same flat surface, i.e., the remains, is not bent at all, but an above-mentioned level difference is in the minimum (zero) condition. In the condition before this deformation, the amount of displacement of the weld zone 21 in the member cross direction A serves as zero to the center position of the stop hole 25 of the stop section 22.

[0023] On the other hand, the condition of drawing 2 (b) is in the condition to which the part of the remains 24 of bending by the side of a weld zone 21 bent at the right angle, and the part of the remains 24 of bending by the side of the stop section 22 bent at the right angle further in it and an opposite direction, and an above-mentioned level difference is in the greatest condition. In the condition after this deformation, the amount of displacement of the weld zone 21 in the member cross direction A is set to $(L \times \sin\theta) / 2$ to the center position of the stop hole 25 of the stop section 22.

[0024] Next, it explains, referring to drawing 3 about a motion of the color sorting machine style by deformation of such supporter material 20. First, a weld zone 21 is direct welded to the frame of a color sorting machine style through a holder 9 among each partition field of the supporter material 20.

Usually, since spot welding is adopted on the occasion of the installation to a frame, the welding marks 26 by spot welding remain in a weld zone 21. Moreover, since the stop section 22 is stopped by inserting in the lock-pin by the side of a fluorescent substance panel the stop hole 25 (the example of drawing Ko Misumi) prepared there, it serves as a fixed location which is not displaced even if heat deformation etc. produces the location of this stop hole 25.

[0025] Thus, the supporter material 20 is attached in the frame of a color sorting machine style, and where the inner surface side of a fluorescent substance panel is equipped with a color sorting machine style through the supporter material 20, the color sorting machine style itself shows the following behavior according to deformation of the supporter material 20 accompanying the thermal expansion of a color sorting machine style.

[0026] Namely, in Saki's phase where the color sorting machine style 3 expands thermally, the location of the welding marks 26 of a weld zone 21 will be in the condition of having shifted crosswise [member] (the same direction as the amendment direction Z) by M dimension, to the center position of the stop hole 25 of the stop section 22 according to the bending angle in early stages of the remains 24 and 24 of bending. If the color sorting machine style 3 expands thermally from this condition, to the supporter material 20, the thrust corresponding to the thermal expansion direction of the color sorting machine style 3 will join the weld zone 21 of that opposite hand as mentioned above by making the stop hole 25 of the stop section 22 into a fixed position.

[0027] If it does so, in order to displace the supporter material 20 to the location shown with the two-dot chain line in drawing from the location shown by the drawing solid line according to the formation direction of the remains 24 and 24 of bending of a couple, in the member cross direction (Z), the above-mentioned gap dimension M will become small. Thereby, in order that the location of the welding marks 26 may approach by N dimension to the center position of the stop hole 25, the color sorting machine style 3 comes to approach the phosphor-screen side of the fluorescent substance panel 2 by the same N dimension as it.

[0028] Therefore, so that the electron beam which passes the slit hole of *** of an aperture grille 7 may collide with the location of the convention on a phosphor screen also before and after thermal expansion of the color sorting machine style 3 It becomes possible to prevent the mistake landing resulting from the thermal expansion of a color sorting machine style by having a parameter including the formation direction of each remains 24 and 24 of bending, and specifying on the conditions which show the migration location (movement magnitude for N dimension) of the aperture grille 7 after thermal expansion to above-mentioned drawing 11.

→ [0029] Even when it does not incidentally necessarily need to be formed in parallel about the remains 24 and 24 of bending of a couple established in the supporter material 20, for example, the remains 24 of bending by the side of the stop section 22 are formed at the include angle theta smaller than it to the formation include angle theta of the remains 24 of bending by the side of a weld zone 21 in drawing 1, it is possible to acquire the prevention effectiveness of mistake landing.

[0030] Then, the structure of the supporter material 20 and the relation of a mounting condition are explained using drawing 4 and drawing 5. That by which the remains 24 and 24 of bending of a couple where drawing 4 is what divided the structure of the supporter material 20 into three types, and (a) divides a weld zone 21, the stop section 22, and pars intermedia 23 among drawing were formed in the member cross direction A and parallel, That in which (b) was formed so that the remains 24 and 24 of bending of a couple might make the member cross direction A and a predetermined include angle, and (c) are formed so that the remains 24 and 24 of bending of a couple may make the member cross direction A and a predetermined include angle, and 2nd remains of bending 24a is prepared in the stop section 22. Among these, the type of (b) was indicated by the Japanese-Patent-Application-No. 08-No. 039356 description of point **, and the type of (c) is adopted with this operation gestalt.

[0031] Where each weld zone 21 is welded to the frame of a color sorting machine style about such three types of supporter material 20, in case the stop hole 25 of the stop section 22 is inserted in the lock-pin by the side of a panel Drawing 5 (a) As shown in - (c), stop section flat-surface 22a becomes a different thing for every type to weld zone flat-surface 21a becoming the reference side F of a lock-pin 12, and parallel by any type.

[0032] That is, in the supporter material 20 of the type of drawing 4 (a), since the remains 24 and 24 of bending of a couple are the member cross direction A and parallel, as shown in drawing 5 (a), stop section flat-surface 22a is inserted in parallel to the reference side F of a lock-pin 12. However, since a color sorting machine style cannot be moved to a panel inner surface side according to deformation of the supporter material 20, this type of case cannot acquire the prevention effectiveness of mistake landing.

[0033] On the other hand, at the supporter material 20 of the type of drawing 4 (b), although the prevention effectiveness of mistake landing is acquired from the remains 24 and 24 of bending of a couple making the member cross direction and a predetermined include angle as mentioned above, as shown in drawing 5 (b), after stop section flat-surface 22a has inclined, in the installation, it will be

inserted in to the reference side F of a lock-pin 12.

[0034] on the other hand, in the supporter material 20 of the type of drawing 4 (c) An include angle the member cross direction and predetermined in the remains 24 and 24 of bending of a couple from being prepared in 2nd remains of bending 24a in nothing and the stop section 22 The prevention effectiveness of mistake landing is acquired like the type of drawing 4 (b), and, moreover, in the installation Since bending shaping by 2nd remains of bending 24a can amend the inclination of stop section flat-surface 22a to weld zone flat-surface 21a, As shown in drawing 5 (c), stop section flat-surface 22a (boundary region of the stop hole 25) comes to be inserted in in the condition more near parallel to the reference side F of a lock-pin 12. Thereby, even when attachment and detachment of a color sorting machine style are repeated at the production process of a fluorescent substance pattern, it decreases that a lock-pin 12 gets damaged by attachment and detachment of the stop section 22.

[0035] In addition, while forming 2nd remains of bending 24a in the stop section 22 stopped at a fluorescent substance panel side in the above-mentioned operation gestalt in the form branched from the end of the remains 24 of bending which divide this stop section 22 and pars intermedia 23 Although this 2nd remains of bending 24a and include-angle theta' with the member cross direction A to make were set up so that it might become smaller than that of the remains 24 and 24 of bending of a couple, this invention is not limited to this.

[0036] Namely, as are shown in drawing 6 (a) and it is shown in what shifted the location from the end of the remains 24 of bending which divide the stop section 22 and pars intermedia 23, and formed 2nd remains of bending 24a, and drawing 6 (b) Even if it forms 2nd remains of bending 24a in the form branched from the other end of the remains 24 of bending which divide the stop section 22 and pars intermedia 23, the same operation effectiveness as the above can be acquired. Incidentally, in the supporter material 20 shown in drawing 6 (b), the include angle of 2nd remains of bending 24a and the member cross direction A (refer to drawing 1) to make is set up more greatly than that of the remains 24 and 24 of bending of a couple.

[0037] Moreover, 2nd remains of bending 24a may be formed in the pars intermedia 23 which adjoins not only the inside of the stop section 22 but this stop section 22 also as a part which forms 2nd remains of bending 24a. As shown in what specifically formed 2nd remains of bending 24a in pars intermedia 23 in the form branched from the end of the remains 24 of bending which divide the stop section 22 and pars intermedia 23 as shown in drawing 7 (a), and drawing 7 (b) As shown in the thing which formed 2nd remains of bending 24a ranging from one side to the other sides of the member cross direction of pars intermedia 23, or drawing 7 (c), various gestalten, such as what changed the formation include angle (dip) of 2nd remains of bending 24a, are employable.

[0038] Furthermore, as shown in drawing 8 (a) as such combination, 2nd remains of bending 24a may be formed in the both sides in the stop section 22 and pars intermedia 23, respectively, and as shown in drawing 8 (b), remains of two bendings (two [or] or more) 24a may be formed in the stop section 22 (or inside of pars intermedia 23). Moreover, it is not limited especially in the any 1 direction as a direction of bending at the time of carrying out bending shaping of the 2nd remains of bending 24a, and it becomes possible by setting up suitably by relation with each angle of bend in the remains 24 and 24 of bending of a couple etc. to amend the inclination of stop section 22 flat surface like the above.

[0039]

[Effect of the Invention] As explained above, according to the cathode-ray tube of this invention, as a configuration of the supporter material for equipping a fluorescent substance panel with a color sorting machine style Make the member cross direction and a predetermined include angle, and form the remains of bending of the couple which divides a weld zone, the stop section, and pars intermedia, and by the inside of pars intermedia, and the thing of stop circles for which the 2nd remains of bending are formed in either at least While being able to prevent the mistake landing accompanying the thermal expansion of a color sorting machine style Since a stop section flat surface can be inserted in the reference side of the lock-pin by the side of a fluorescent substance panel in the condition more near parallel, it becomes possible to prevent effectively the discharge phenomenon which originated that a lock-pin should delete in the shaving dregs.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the former, the spring structure support (bimetal components are called hereafter) of the bimetal which stuck two kinds of metal plates with which coefficient of thermal expansion differs by welding as a configuration of the supporter material 10 attached in a frame 8 was adopted, this bimetal component was dramatically expensive, and since the difficulty was in workability, when aiming at the cost cut of a cathode-ray tube, it had become a serious failure.

[0010] Then, these people have already proposed the cathode-ray tube equipped with the new supporter material which can prevent mistake landing like bimetal components, without using expensive bimetal components (Japanese-Patent-Application-No. No. 039356 [08 to] description).

[0011] In the cathode-ray tube indicated by the description of the above-mentioned point ** The weld zone by which the tabular supporter material for equipping the inner surface side of a fluorescent substance panel with a color sorting machine style is welded to a color sorting machine style side, It consists of the pars intermedia which connects the stop section stopped at a fluorescent substance panel side, and its weld zone and stop section, and the remains of bending of the couple which moreover divides those weld zones, the stop section, and pars intermedia have composition which made the member cross direction and a predetermined include angle, and was formed. And when the supporter material which supports this deforms according to the formation direction of the remains of bending of a couple, he moves a color sorting machine style to a panel inner surface (phosphor screen) side, and is trying to prevent mistake landing, when a color sorting machine style causes thermal expansion.

[0012] By the way, in the cathode-ray tube using the supporter material of point **, it is in the condition which welded the weld zone to the color sorting machine style side, and in case the stop hole prepared in the stop section of the opposite hand is inserted in the lock-pin of a fluorescent substance panel, a stop section flat surface is not parallel to the reference side (virtual flat surface parallel to the inner skin of the panel skirt section in which a lock-pin is prepared) of a lock-pin. Since this needs to make rigidity of supporter material high when supporting a color sorting machine style, and it needs to give moderate spring elasticity to supporter material between a color sorting machine style and a fluorescent substance panel, it is for a stop section flat surface to incline to a weld zone flat surface with the torsal rigidity and spring elasticity. When the condition after inserting in incidentally before inserting the stop hole of the stop section in a lock-pin is searched for in simulation (FEM analysis), the result that the relation between a weld zone flat surface and a stop section flat surface hardly changes is obtained.

[0013] Thus, in the situation that a stop section flat surface inclines and is inserted in, when attachment and detachment of a color sorting machine style are repeated at the process which produces red, green, and a blue fluorescent substance pattern to the inner surface of a fluorescent substance panel, a lock-pin becomes easy to get damaged by attachment and detachment of the stop section, the shaving dregs of this lock-pin twisted for getting damaged adhere to an electron gun, and a cathode-ray tube becomes easy to discharge.

[0014] So, in this invention, even if it does not use expensive bimetal components, while being able to prevent the mistake landing by thermal expansion etc., it aims at offering the cathode-ray tube which can decrease with [of the lock-pin accompanying attachment and detachment of a color sorting machine style] a blemish.

[Translation done.]

[Brief Description of the Drawings]

[Drawing 1] It is drawing which explains the configuration of the supporter material for equipping a fluorescent substance panel with a color sorting machine style as 1 operation gestalt of the cathode-ray tube concerning this invention.

[Drawing 2] It is a top view explaining the deformation process of supporter material.

[Drawing 3] It is drawing explaining a motion of the color sorting machine style by deformation of supporter material.

[Drawing 4] It is drawing having shown the structure of supporter material according to the type.

[Drawing 5] It is drawing showing the mounting condition according to type of supporter material.

[Drawing 6] It is drawing (the 1) explaining the modification of this invention.

[Drawing 7] It is drawing (the 2) explaining the modification of this invention.

[Drawing 8] It is drawing (the 3) explaining the modification of this invention.

[Drawing 9] It is the perspective view showing the example of a configuration of the cathode-ray tube in the former.

[Drawing 10] It is the perspective view showing the example of a configuration of a color sorting machine style.

[Drawing 11] It is a mimetic diagram explaining mistake landing.

[Description of Notations]

1 [-- A lock-pin, 20 / -- Supporter material, 21 / -- A weld zone, 22 / -- The stop section, 23 / -- Pars intermedia, 24 / -- The remains of bending, 24a / -- The 2nd remains of bending 25 / -- A stop hole, F / -- Reference side] -- A cathode-ray tube, 2 -- A fluorescent substance panel, 3 -- A color sorting machine style, 12

MEANS

[Means for Solving the Problem] The weld zone by which the tabular supporter material for equipping the inner surface side of a fluorescent substance panel with a color sorting machine style is welded to a color sorting machine style side in the cathode-ray tube concerning this invention, While consisting of the pars intermedia which connects the stop section stopped at a fluorescent substance panel side, and said weld zone and said stop section The remains of bending of the couple which divides these weld zones, the stop section, and pars intermedia make the member cross direction and a predetermined include angle, and are formed. And it has the composition in which the 2nd remains of bending for amending the inclination of the as opposed to [at least] weld zone flat surface to either stop section flat surface stop circles and in pars intermedia were formed.

[0016] It is in the condition which welded the weld zone of supporter material to the color sorting machine style side, and stopped this stop section to the fluorescent substance panel side in the cathode-ray tube which consists of the above-mentioned configuration. If a color sorting machine style causes thermal expansion at the time of the actuation, according to the formation direction of the remains of bending of a couple, a color sorting machine style will move to a panel inner surface (phosphor screen) side with a weld zone, and the mistake landing by the thermal expansion of a color sorting machine style will be prevented by this. Moreover, amendment of the inclination of the stop section flat surface over a weld zone flat surface is attained by [of inside of pars intermedia, and stop circles] having formed the 2nd remains of bending in either at least.

[0017]

[Embodiment of the Invention] Hereafter, it explains to a detail, referring to a drawing about the gestalt of operation of this invention. Drawing 1 is drawing which explains the configuration of the supporter material for equipping a fluorescent substance panel with a color sorting machine style as 1 operation gestalt of the cathode-ray tube concerning this invention, among drawing, (a) is the development view and (b) is the perspective view. Moreover, in the cross direction of supporter material, and the direction of B, the direction of A shows the longitudinal direction of supporter material among A written in addition on drawing, and the direction of B, respectively.

[0018] The illustrated supporter material 20 makes tabular [thin], and consists of pars intermedia 23 which connects the weld zone 21 welded to a color sorting machine style side (frame 8 of drawing 9), the stop section 22 stopped at a fluorescent substance panel side (lock-pin 12 of drawing 10), and these weld zones 21 and the stop section 22. Moreover, a weld zone 21, the stop section 22, and pars intermedia 23 are divided by the remains 24 and 24 of bending of a couple, respectively, bending shaping is carried out at an angle of predetermined bordering on each remains 24 and 24 of bending, and a level difference is secured by this between a weld zone 21 and the stop section 22. In case this level difference inserts in the lock-pin by the side of a fluorescent substance panel the stop hole 25 (the example of drawing round hole) prepared in the stop section 22, it is needed, and it is suitably set up according to the angle of bend in early stages of the remains 24 of bending.

[0019] Moreover, the remains 24 and 24 of bending of the couple which divides a weld zone 21, the stop section 22, and pars intermedia 23 as mentioned above make the member cross direction A and the predetermined include angle theta (the example of drawing about 45 degrees), and are mutually formed in parallel. The include angle theta which the remains 24 and 24 of bending and the member cross direction A make The amount of mistake landing by the thermal expansion of the color sorting machine style 3 grasped theoretically or experimentally beforehand (the amount of alpha in drawing 11) to collimation It is the include angle suitably set up in consideration of die-length [of the bending angle in early stages of the coefficient of thermal expansion and the remains 24 of bending of the supporter material 20 (tilt angle of pars intermedia 23), and the pars intermedia / in / further / the member longitudinal direction B / 23] L etc.

[0020] Furthermore, in the stop section 22 which has the stop hole 25, 2nd remains of bending 24a with the another remains 24 and 24 of bending of a up Norikazu pair is formed. Include-angle theta' with the member cross direction A to make is small set up rather than the remains 24 of bending where this 2nd remains of bending 24a divides the stop section 22 and pars intermedia 23 ($\theta > \theta'$). And as shown in drawing 1 (b), where bending shaping of the supporter material 20 is carried out, the direction of bending in the remains 24 of bending which divide the stop section 22 and pars intermedia 23 to the direction of bending in the remains 24 of bending which divide a weld zone 21 and pars intermedia 23 is set as an opposite direction, and the direction of bending in 2nd remains of bending 24a in the stop section 22 is also set as the opposite direction.

[0021] Here, it explains using drawing 2 and drawing 3 about the remains 24 of bending of a couple established in the supporter material 20, and the prevention effectiveness of the mistake landing depended 24.

[0022] Drawing 2 is a top view explaining the deformation process of the supporter material 20, among drawing, (a) shows the condition before deformation and (b) shows the condition after deformation. First, the part in the condition 24 and 24 of bending that, as for the condition of drawing 2 (a), a weld zone 21, the stop section 22, and pars intermedia 23 are making the same flat surface, i.e., the remains, is not bent at all, but an above-mentioned level difference is in the minimum (zero) condition. In the condition before this deformation, the amount of displacement of the weld zone 21 in the member cross direction A serves as zero to the center position of the stop hole 25 of the stop section 22.

[0023] On the other hand, the condition of drawing 2 (b) is in the condition to which the part of the remains 24 of bending by the side of a weld zone 21 bent at the right angle, and the part of the remains 24 of bending by the side of the stop section 22 bent at the right angle further in it and an opposite direction, and an above-mentioned level difference is in the greatest condition. In the condition after this deformation, the amount of displacement of the weld zone 21 in the member cross direction A is set to $(L_{x\sin\theta}) / 2$ to the center position of the stop hole 25 of the stop section 22.

[0024] Next, it explains, referring to drawing 3 about a motion of the color sorting machine style by deformation of such supporter material 20. First, a weld zone 21 is direct welded to the frame of a color sorting machine style through a holder 9 among each partition field of the supporter material 20.

Usually, since spot welding is adopted on the occasion of the installation to a frame, the welding marks 26 by spot welding remain in a weld zone 21. Moreover, since the stop section 22 is stopped by inserting in the lock-pin by the side of a fluorescent substance panel the stop hole 25 (the example of drawing Ko Misumi) prepared there, it serves as a fixed location which is not displaced even if heat deformation etc. produces the location of this stop hole 25.

[0025] Thus, the supporter material 20 is attached in the frame of a color sorting machine style, and where the inner surface side of a fluorescent substance panel is equipped with a color sorting machine style through the supporter material 20, the color sorting machine style itself shows the following behavior according to deformation of the supporter material 20 accompanying the thermal expansion of a color sorting machine style.

[0026] Namely, in Saki's phase where the color sorting machine style 3 expands thermally, the location of the welding marks 26 of a weld zone 21 will be in the condition of having shifted crosswise [member] (the same direction as the amendment direction Z) by M dimension, to the center position of the stop hole 25 of the stop section 22 according to the bending angle in early stages of the remains 24 and 24 of bending. If the color sorting machine style 3 expands thermally from this condition, to the supporter material 20, the thrust corresponding to the thermal expansion direction of the color sorting machine style 3 will join the weld zone 21 of that opposite hand as mentioned above by making the stop hole 25 of the stop section 22 into a fixed position.

[0027] If it does so, in order to displace the supporter material 20 to the location shown with the two-dot chain line in drawing from the location shown by the drawing solid line according to the formation direction of the remains 24 and 24 of bending of a couple, in the member cross direction (Z), the above-mentioned gap dimension M will become small. Thereby, in order that the location of the welding marks 26 may approach by N dimension to the center position of the stop hole 25, the color sorting machine style 3 comes to approach the phosphor-screen side of the fluorescent substance panel 2 by the same N dimension as it.

[0028] Therefore, so that the electron beam which passes the slit hole of **** of an aperture grille 7 may collide with the location of the convention on a phosphor screen also before and after thermal expansion of the color sorting machine style 3 It becomes possible to prevent the mistake landing resulting from the thermal expansion of a color sorting machine style by having a parameter including the formation direction of each remains 24 and 24 of bending, and specifying on the conditions which show the migration location (movement magnitude for N dimension) of the aperture grille 7 after thermal expansion to above-mentioned drawing 11.

[0029] Even when it does not incidentally necessarily need to be formed in parallel about the remains 24 and 24 of bending of a couple established in the supporter material 20, for example, the remains 24 of bending by the side of the stop section 22 are formed at the include angle theta smaller than it to the formation include angle theta of the remains 24 of bending by the side of a weld zone 21 in drawing 1, it is possible to acquire the prevention effectiveness of mistake landing.

[0030] Then, the structure of the supporter material 20 and the relation of a mounting condition are

explained using drawing 4 and drawing 5. That by which the remains 24 and 24 of bending of a couple where drawing 4 is what divided the structure of the supporter material 20 into three types, and (a) divides a weld zone 21, the stop section 22, and pars intermedia 23 among drawing were formed in the member cross direction A and parallel, That in which (b) was formed so that the remains 24 and 24 of bending of a couple might make the member cross direction A and a predetermined include angle, and (c) are formed so that the remains 24 and 24 of bending of a couple may make the member cross direction A and a predetermined include angle, and 2nd remains of bending 24a is prepared in the stop section 22. Among these, the type of (b) was indicated by the Japanese-Patent-Application-No. 08-No. 039356 description of point **, and the type of (c) is adopted with this operation gestalt.

[0031] Where each weld zone 21 is welded to the frame of a color sorting machine style about such three types of supporter material 20, in case the stop hole 25 of the stop section 22 is inserted in the lock-pin by the side of a panel Drawing 5 (a) As shown in - (c), stop section flat-surface 22a becomes a different thing for every type to weld zone flat-surface 21a becoming the reference side F of a lock-pin 12, and parallel by any type.

[0032] That is, in the supporter material 20 of the type of drawing 4 (a), since the remains 24 and 24 of bending of a couple are the member cross direction A and parallel, as shown in drawing 5 (a), stop section flat-surface 22a is inserted in parallel to the reference side F of a lock-pin 12. However, since a color sorting machine style cannot be moved to a panel inner surface side according to deformation of the supporter material 20, this type of case cannot acquire the prevention effectiveness of mistake landing.

[0033] On the other hand, at the supporter material 20 of the type of drawing 4 (b), although the prevention effectiveness of mistake landing is acquired from the remains 24 and 24 of bending of a couple making the member cross direction and a predetermined include angle as mentioned above, as shown in drawing 5 (b), after stop section flat-surface 22a has inclined, in the installation, it will be inserted in to the reference side F of a lock-pin 12.

[0034] on the other hand, in the supporter material 20 of the type of drawing 4 (c) An include angle the member cross direction and predetermined in the remains 24 and 24 of bending of a couple from being prepared in 2nd remains of bending 24a in nothing and the stop section 22 The prevention effectiveness of mistake landing is acquired like the type of drawing 4 (b), and, moreover, in the installation Since bending shaping by 2nd remains of bending 24a can amend the inclination of stop section flat-surface 22a to weld zone flat-surface 21a, As shown in drawing 5 (c), stop section flat-surface 22a (boundary region of the stop hole 25) comes to be inserted in in the condition more near parallel to the reference side F of a lock-pin 12. Thereby, even when attachment and detachment of a color sorting machine style are repeated at the production process of a fluorescent substance pattern, it decreases that a lock-pin 12 gets damaged by attachment and detachment of the stop section 22.

[0035] In addition, while forming 2nd remains of bending 24a in the stop section 22 stopped at a fluorescent substance panel side in the above-mentioned operation gestalt in the form branched from the end of the remains 24 of bending which divide this stop section 22 and pars intermedia 23 Although this 2nd remains of bending 24a and include-angle theta' with the member cross direction A to make were set up so that it might become smaller than that of the remains 24 and 24 of bending of a couple, this invention is not limited to this.

[0036] Namely, as are shown in drawing 6 (a) and it is shown in what shifted the location from the end of the remains 24 of bending which divide the stop section 22 and pars intermedia 23, and formed 2nd remains of bending 24a, and drawing 6 (b) Even if it forms 2nd remains of bending 24a in the form branched from the other end of the remains 24 of bending which divide the stop section 22 and pars intermedia 23, the same operation effectiveness as the above can be acquired. Incidentally, in the supporter material 20 shown in drawing 6 (b), the include angle of 2nd remains of bending 24a and the member cross direction A (refer to drawing 1) to make is set up more greatly than that of the remains 24 and 24 of bending of a couple.

[0037] Moreover, 2nd remains of bending 24a may be formed in the pars intermedia 23 which adjoins not only the inside of the stop section 22 but this stop section 22 also as a part which forms 2nd remains of bending 24a. As shown in what specifically formed 2nd remains of bending 24a in pars intermedia 23 in the form branched from the end of the remains 24 of bending which divide the stop section 22 and pars intermedia 23 as shown in drawing 7 (a), and drawing 7 (b) As shown in the thing which formed 2nd remains of bending 24a ranging from one side to the other sides of the member cross direction of pars intermedia 23, or drawing 7 (c), various gestalten, such as what changed the formation include angle (dip) of 2nd remains of bending 24a, are employable.

[0038] Furthermore, as shown in drawing 8 (a) as such combination, 2nd remains of bending 24a may be formed in the both sides in the stop section 22 and pars intermedia 23, respectively, and as shown in drawing 8 (b), remains of two bendings (two [or] or more) 24a may be formed in the stop section 22 (or inside of pars intermedia 23). Moreover, it is not limited especially in the any 1 direction as a direction of bending at the time of carrying out bending shaping of the 2nd remains of bending 24a, and it becomes possible by setting up suitably by relation with each angle of bend in the remains 24 and 24 of bending of a couple etc. to amend the inclination of stop section 22 flat surface like the above.

[Translation done.]